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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/648,768	08/28/2000	Toshiyuki Sudo	2369.12202	5712

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EXAMINER

CHANG, AUDREY Y

ART UNIT PAPER NUMBER

2872

DATE MAILED: 11/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

GA

Office Action Summary	Application No. 09/648,768	Applicant(s) SUDO ET AL.	
	Examiner Audrey Y. Chang	Art Unit 2872	

-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 and 51-55 is/are pending in the application.
- 4a) Of the above claim(s) 3, 51, 53 and 54 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4-10, 52 and 55 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

- A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August 11, 2003 has been entered.
- This Office Action is also in response to applicant's amendment filed on August 11, 2003, which has been entered as paper number 16.
- By this amendment, the applicant has amended claims 1-10 and has newly added claims 51-55.
- Newly submitted claims 3, 51, 53 and 54 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: claim 3 and its dependent claims 51, 53 and 54 are drawn to a *illumination means*, which is a feature for the distinct invention group (III). The applicant is respectfully noted that the restriction requirement was set forth in the **paper number 5**.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, *claims 3, 51, 53 and 54 are withdrawn* from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

- The applicant is also respectfully noted that the dependency of claims 4-6, 7, 9, 52 and 55 on claim 3 is improper.
- The applicant is respectfully noted that request for continuation examination (RCE) could only be filed for **FINALLY** rejected claims, no new invention groups or species could be submitted.
- Claims 1-2, 4-10, 52 and 55 remain pending in this application.

~~Claim Objections~~

1. Claims 1-2, 4-10, 52 and 55 are objected to because of the following informalities:

(1). The phrase "a portion of an exit pupil" recited in claim 1 is confusing and indefinite since it is not clear the exit pupil is referred to what, to the whole display apparatus or the optical system.

Clarification is required.

(2). The phrase "for presenting a given image to a given portion of an exit pupil" recited in claim 1 is confusing and indefinite since it is not clear what is this given image and what is this exit pupil. Are they different from the parallax image and exit pupil claimed before?

(3). The phrase "a portion of an optical path of which is overlapped" recited in claim 1 is confusing and indefinite since it is not clear what does it mean the optical path be overlapped with itself?

(4). The newly submitted claim 52 is *incomplete* since it fails to provide *structural* and *logical* relationships with respect to the image display apparatus recited in its based claim. The phrase "can be" is confusing since it is not clear if the limitations after the phrase is or is not part of the claim.

(5). The phrase "an image display system comprising a pair of image display systems " recited in claim 55 is confusing and indefinite since it is not clear what is the scope of the claim.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. ~~Claims 1-2, and 4-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Hoshi (PN. 5,825, 539) in view of the patent issued to Sudo (PN. 5,719,701).~~

Hoshi teaches a *multi-eye type image display apparatus* that can be applied to a *head mount display* (HMD), wherein the apparatus comprising a *right-eye image display means* and a *left-eye image display means* that each displays a *parallax image* to right eye and left eye respectfully, (please see Figures 1-3), wherein each of the right eye and left eye image display means serves as the *image display apparatus* for providing multi-eye parallax images to a *single eye*. Hoshi teaches that each of the right eye image display means and the left eye image display means comprises a *liquid crystal display* (5R and 5L), serve as the *image display means*, and an *display optical system*, (including lens members 2 and 3 and optical filter 4), for guiding the light from liquid crystal displays or image display means to an exit pupil, located at the viewing position of the observer.

Hoshi teaches that an optical filter (4R and 4L) having light *transparent region* (4a) and light *attenuating region* (4b) that can be driven by an *actuator driver* such that different parallax image can be present to different portion of the observing zones of the observer or exit pupil to provide 3D or panorama 2D image display to the observer, (please see Figures 1-3 and 7A and 7B). The parallax images are recognized *further* than the display optical system. Sudo in the same field of endeavor teaches a *stereoscopic image display device* that is comprised of an *image display device* (30 Figure 11), serves as the *image display means*, for displaying a plurality of *parallax images*, a *projection lens* (22) serves as the *display optical system* for guiding the light to an *exit pupil area* (27) of the optical system, which is to a *single eye at a time*. The display device also comprises an *exit pupil control means* (23) that both *spatially* and *temporally* divides the exit pupil of the display optical system (located at the exit pupil plane Q_i) at the position of the eye of an observer *into a plurality of areas* that correspond to the exit pupil areas (27 as shown in Figure 18) and controls the light passes through the control means to each of the exit pupil areas. The display device further comprises a *switching circuit* (29) that controls the switching of

~~the exit pupil control means in synchronization with the parallax images displayed on the display device,~~
(please see Figure 11 and columns 13-14). It would then have been obvious to one skilled in the art to apply the teachings of Sudo to modify the right eye and left eye image display means of Hoshi for the benefit of providing a more accurate pupil control means so that a multiple parallax images for providing a multiple views of three dimensional image can be displayed and viewed by the observer at *different portions* of the exit pupil.

With regard to claim 4, both Hoshi and Sudo do not teach *explicitly* that the size of the exit pupil area is less than half of the size of the pupil of the observer. However such feature is either inherently met in order for the parallax image to be presented to a single eye at a time to enable 3D viewing or an obvious modification to one skilled in the art since it mainly involves the choice of the aperture size of the exit pupil control means (23) for the benefit of obtaining desired image quality displayed and observed by the observer.

With regard to claim 5, Hoshi teaches that the image display apparatus is for a head mount display (HMD), (please see column 4).

With regard to claim 6, both Hoshi and Sudo teach that the exit pupil is divided in the horizontal direction.

With regard to claims 7-10, both Hoshi and Sudo teach that the image display device comprises a *liquid crystal display device*, which is a form of spatial light modulator. Sudo also teaches that the exit pupil control means is comprised of a *light valve*, which also is a form of spatial light modulator. Although this reference does not teach explicitly that the spatial light modulator is a self-emissive type or the exit pupil control means may also be comprised of a micro-mirror device however since self-emissive type spatial light modulator and micro-mirror device are both well known in the art and the specification fails to teach the criticality of using these particular elements would overcome any problem in the prior

~~art such modifications are considered to be obvious matter of design choices to one skilled in the art for~~
they perform the same functions as the elements in the cited references.

4. **Claims 52 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patents issued to Hoshi and Sudo as applied to claim 1 above, and further in view of the patent issued to Ono (PN. 6,233,003).**

The *multi-eye type image display apparatus* taught by *Hoshi* in combination with the teachings of *Sudo* as described for claim 1 above have met all the limitations of the claims. *Hoshi* does not teach explicitly about an image input apparatus. *Sudo* teaches that the image display device (30) comprises an *image producing means* (1) including image pickup device for inputting parallax images to the display device, (please see column 13 and Figure 11). These references however do not teach the details of the image producing means claimed by the applicant. *Ono* in the same field of endeavor teaches a *parallax image input apparatus* that is comprised of an *imaging device* (16), serves as the *image capture means* for imaging an object (1, 2 or 3), an *imaging forming lens* (14) serves as the *imaging optical system* for guiding the light from the object to the imaging device, and a *lens pupil aperture position control means* (15) for *spatially* and *temporally dividing* the pupil of the lens into a plurality of areas and controlling the passing of light beam to each area. The apparatus also comprises a general *control unit* (18) for controlling the switching of the pupil aperture position control means and the imaging recording device for effectively inputting the parallax image, (please see Figure 10 columns 11-12). It would then have been obvious to one having ordinary skill in the art to apply the teachings of parallax image input apparatus of *Ono* to the stereoscopic image display apparatus of *Hoshi* in view of *Sudo* for the benefit of providing a stereoscopic image pickup and display device. Although this reference does not teach explicitly about of the size of the aperture of the image input apparatus to be less than the half of the human pupil and the position separation for different locations of the aperture is equal to the size of

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human pupil, such features are either inherently met for obtaining parallax image to produce 3D display or an obvious modification to one skilled in the art for obtaining optimum operational mode for the image display system with the image input apparatus.

Response to Arguments

5. Applicant's arguments with respect to claims 1-2 and 4-10 have been considered but are moot in view of the new ground(s) of rejection. The newly submitted claims have been fully considered and they are rejected for the reasons stated above.

Double Patenting

6. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

7. Claim 1 is provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claim 1 of copending Application No. 10/430,332. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

The applicant is respectfully noted that although in the copending application, the term "control means" instead of "exit pupil control means" is used, they are the same since they perform exactly the same function as defined in the claims.

8. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA

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1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

9. Claims 1-2, 4-10, 52, and 55 are provisionally-rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-2 and 55 of copending Application No. 10/430,332. Although the conflicting claims are not identical, they are not patentably distinct from each other because they both claim essentially the same image display apparatus.

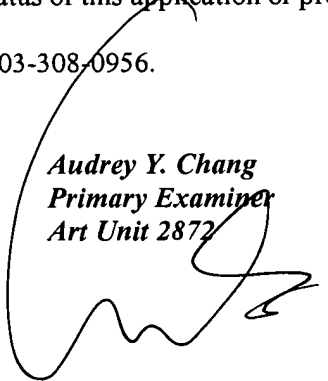
This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 703-305-6208. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 703-305-0024. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Audrey Y. Chang
Primary Examiner
Art Unit 2872



A. Chang, Ph.D.